7.0   Geospatial Information and Electronic Submittals

7.1   General

7.1.01   This chapter describes the incorporation of GIS into the MEC removal action at the Culebra municipality and provides the specific GIS and land survey requirements for the site. All spatial data will conform to the CADD (computer-aided design and drafting) / GIS Technology Center Spatial Data Standards for Facilities Infrastructure and Environment (SDSFIE) GIS data standard as outlined in the task order SOW (Appendix A). Metadata will be created for the core MEC-GIS data layers and will be prepared in accordance with Federal Geographic Data Committee (FGDC) metadata standards.

7.1.02   A Puerto Rico-licensed professional land surveyor will certify all surveying requirements to include all control points, grid corners, transect points, and boundaries as required by the project. The northing and easting coordinates for all control points, grid corners, transect points, and any boundaries or closures will be presented in a certified letter or drawing, along with an electronic submittal of the same to CEHNC upon completion of the field work.

7.1.03   All site boundary surveys will be completed as outlined in the SOW and the basic contract. A UXO technician, who may conduct both a visual and magnetometer survey of the area, will escort the survey crew. No intrusive activity will take place until the UXO technician conducts an electromagnetic survey of the area and concludes that the area is safe.

7.1.04   The locations of individual recovered MEC items will be determined by GPS or by tape measurement to obtain a horizontal accuracy of 5 feet within the grid or subgrid, and plotted and identified on the map. Where more than 50 items are located within the area of a quarter of the grid or subgrid, the location of the concentration extent will be mapped along with the number of items found in that area of the grid or subgrid.

7.1.1   Accuracy

7.1.1.01   In surveying, horizontal and vertical control of "Class I, Third Order" or better will be established for the network control points. Horizontal control will be based on the metric system and referenced to North American Datum 1927 (Puerto Rico) and the UTM grid system Zone 19. Vertical control, if required, will also be based on the metric system and referenced to NAVD88.

7.1.1.02   The horizontal data will be surveyed to an accuracy of ±1 foot. The elevation data will be accurate to 0.1 foot. EEG personnel will have to collect data for a minimum of 5 minutes at each location to achieve ±1-foot accuracy. EEG will set up a second dual frequency Trimble GPS over a control point in areas where the correction beacon signal cannot be detected. The data collected by the second device will be used to process the Pro XR data.

7.1.2   Geographic Information System Incorporation

Spatial data (i.e., grid corners, MEC locations, control points, etc.) generated for this removal action are to be provided in ESRI (ArcView/ArcInfo) format during the project, and in neutral, non-proprietary Spatial Data Transfer Standard (SDTS) format at the completion of the project. Supporting tabular data may be provided in either Microsoft Excel or Microsoft Access database format. The final submittal in electronic format will contain all required project files and layout files for all plates, figures, and drawings conveyed in the appropriate final report. The government will provide EEG with geospatial aerial photography data to include orthomosaics, geo-referenced TIF files, MrSID files, Metadata files, etc.

7.1.3   Plotting

7.1.3.01   All of the control points established at the site will be plotted at the appropriate coordinate points on reproducible electronic or hard-copy media for production of planimetric or topographic maps at scales appropriate for the parcel size being described:

- Parcels less than 10 acres will be plotted at 1:200.
- Parcels 10 to 100 acres will be plotted at 1:600 (1 inch = 50 feet).
- Parcels larger than 100 acres will be plotted at 1:2400 (1 inch = 200 feet).

7.1.3.02   Area maps will be provided for parcels of 100 acres and will show sheet breakdown for subsequent sheets required for the set.

7.1.4   Mapping

7.1.4.01   An overall planimetric design file will be created and will be digitized into a MicroStation DGN file at an elevation of zero. Each sheet will be a standard metric A-1 size drawing, which is 841 mm by 594 mm (33.1 inches by 23.4 inches). Each sheet will also have a standard border; revision block; title block; complete index sheet layout; bar scale; legend; grid lines or grid tic layout in meters; and a true north, a magnetic north, and a grid north arrow, with

their differences shown in degrees, minutes, and seconds. Each sheet will be plotted at the horizontal scales required. The contractor's logo will not dominate the title block and sheet border. The standard A-1 sheet size title block and border define the text size, location, and format.

7.1.4.02   The location, ID, coordinates, and elevations of all the control points recovered and/or established at the site will be plotted on reproducible media for planimetric or topographic maps. The figure scales will be such that the grids and MEC items found at the site are easily identified. Each control point will be identified on the map by its name and number and the final adjusted horizontal coordinates and elevations (to the closest 0.001 meter and 0.01 foot, respectively). Grid lines or tic marks at systematic intervals with their grid values will be shown on the edges of the map. Also, a legend showing the standard symbols used for the mapping and a map index showing the site in relationship to all other sites within the boundary lines of the project area will be shown.

7.2   Digital Design Data

7.2.01   The digital data set and all supporting files/data will be provided in an attached cell library. EEG will also provide a fully documented data manual with all production and work files. The manual will include all specific information enabling an outsider to be able to recreate all products and determine the location, names, structures, and association of the data such as layer description, weights, colors, symbols, referencing of files, etc. The manual will also be included as an ASCII file titled READ.ME that is included with all distributed digital data.

7.2.02   Until proven compatible with the CEHNC graphics system, no digital data will be acceptable. All revisions that are required to ensure compatibility with the CEHNC graphics system will be made at the EEG's own expense.

7.3   Computer Files and Digital Data Sets

7.3.01   All final document files (e.g., reports and associated figures and tables) generated will be furnished to CEHNC in IBM PC-compatible Microsoft Office 97 or higher software and in Adobe Portable Document Format (PDF). All final text files will be submitted in Microsoft Word 98 or higher with spreadsheets in Excel. Products will be suitable for viewing, without modification, on the Internet. Freeware versions of Adobe Acrobat Reader, Netscape, and Microsoft Internet Explorer, as appropriate, will accompany the document files on compact disk

(CD-ROM) so that the user can use the CD to either install the programs and documents on a machine, or use the CD in a stand-alone mode to view the document files.

7.3.02   All in-progress and fielded GIS data, design drawings, survey data, relational databases, geophysical data, and other related data may be required to be available on line to the government by HTTP or FTP download or by Web-based GIS queries as specified for the project. All final GIS data generated will be submitted in non-proprietary SDTS format at the close of the project, as well as in the Micro Station (MGE) format. All formal GIS data submittals will be made on PC CD-ROM. Each submittal will be accompanied by a freeware viewer application appropriate for reviewing the proprietary formatted GIS data as well as by instructions for loading the data and viewer application.